

**09/528,952**  
**Notice of Allowability**

Application No.

09/528,952

Examiner

Lun-See Lao

Applicant(s)

SCALART ET AL.

Art Unit

2643

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 03-20-2000.
2. ☒ The allowed claim(s) is/are 1-24.
3. ☐ The drawings filed on \_\_\_\_\_ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

  
**DUC NGUYEN**  
**PRIMARY EXAMINER**

## **DETAILED ACTION**

### ***Examiner's Amendment***

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Attorney Rupp, Brian, on January 6, 2005.
3. The Drawing has been amended as follows:  
  
Figures 1-2 should be designated by a legend such as "prior art".  
  
See the attached examiner's amendment page 4-5.

### ***Allowable Subject Matter***

4. Claims 1-24 are allowed.

### ***Conclusion***

5. Any response to this action should be mailed to:  
  
Commissioner of Patents and Trademarks  
  
Washington, D.C. 20231  
  
or faxed to:(703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington.

VA., Sixth Floor (Receptionist).


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (703) 305-2259. The examiner can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao,Lun-See  
Patent Examiner  
US Patent and Trademark Office  
Crystal Park 2  
(703305-2259)

  
**DUC NGUYEN**  
**PRIMARY EXAMINER**

## DETAILED ACTION

### *Introduction*

1. This is response to the Application 09/528,952 filed on 01-05-2004. Claims 1-24 are pending.

### ***Allowable Subject Matter***

2. Claims 1-24 are allowed.
3. The following is an examiner's statement of reasons for allowance:

Regarding claims 1-8, Applicant's prior art teaches an adaptive identification method for estimating a response of a system to an input signal, comprising the steps of:

receiving the input signal (see fig.1,  $X_t$ ) and an observation signal ( $b_t$ ), whereby the observation signal has a component consisting of said response to the input signal ;

determining an error signal  $e_t$  at an instant  $t$  according to as  $e_t = Y_t - X_t^T H_{t-1}$ , (specification page 2, equation 1), where  $y_t$  denotes a value of the observation signal ( $b_t$ ) at the instant  $t$ ,  $H_{t-1}$  is a column vector made up of  $L$  coefficients of a identification filter having a finite impulse response representative of an impulse response of the system, and  $X_t^T = (x_t, x_{t-1}, \dots, x_{t-L+1})$  is a row vector made up of the values  $x_t, x_{t-1}, \dots, x_{t-L+1}$  of the input signal at the instant  $t$  and at  $L-1$  preceding instants (see specification page 1 line 13-page 2 line 26);

obtaining prediction parameters of the input signal, whereby an energy of a prediction residue on successive frames of the input signal is minimized (see specification page 1 line 13-col.2 line 26).

However, the prior of record fails to teach that adapting the L coefficients of the identification filter by adding to the column vector  $H_{t-1}$ , a column vector proportional to

$\frac{e_t}{X_t^T U_t + \lambda} U_t$ , where  $U_t$  is a column vector made up of L values of the prediction

residue of the input signal at the instant t and at the L-1 preceding instants, and  $\lambda$ , is a positive or zero coefficient. These limitations, in combination with the remaining limitation of claims 1-8, are not taught nor suggested by the prior art of record.

Regarding claims 9-16, Applicant's prior art teaches an adaptive identification device for a system to which an input signal is applied, comprising:

- a first input for receiving the input signal (see fig.1,  $X_t$ ) ;
- a second input for receiving an observation signal ( $b_t$ ) having a component consisting of a response of the system to the input signal ;
- an identification filter (18) having a finite impulse response representative of an impulse response of the system ;
- a subtractor (20) producing an error signal by subtracting from the observation signal the input signal filtered by the identification filter, wherein the error signal  $e_t$  produced by the subtractor (20) at an instant t is expressed as  $e_t = Y_t - X_t^T H_{t-1}$ , (specification page 2, equation 1), where  $y_t$  denotes a value of the observation signal at the instant t,  $H_{t-1}$  is a column vector made up of L coefficients of the

identification filter(18), and  $X_t^T = (x_t, x_{t-1}, \dots, x_{t-L+1})$  is a row vector made up of the values  $x_t, x_{t-1}, \dots, x_{t-L+1}$  of the input signal at the instant  $t$  and at  $L-1$  preceding instants(see specification page 1 line 13-page 2 line 26);

means for obtaining prediction parameters from the input signal, whereby the energy of a prediction residue on successive frames of the input signal is minimized (see specification page 1 line 13-page 2 line 26).

However, the prior of record fails to teach that means for adapting the coefficients of the identification filter by adding to the column vector  $H_{t-1}$  a column vector proportional to  $\frac{e_t}{X_t^T U_t + \lambda} U_t$ , where  $U_t$  is a column vector made up of the  $L$  values of the prediction residue of the input signal at the instant  $t$  and at the  $L-1$  preceding instants, and  $\lambda$  is a positive or zero coefficient. These limitations, in combination with the remaining limitation of claims 9-16, are not taught nor suggested by the prior art of record.

Regarding claims 17-24, Applicant's prior art teaches an adaptive echo canceller for removing echo components of a direct signal from a return signal, comprising

a first input for receiving the direct signal (see fig.1,  $X_t$ ) ;

a second input for receiving the return signal ( $b_t$ ) ;

an identification filter (20) having a finite impulse response representative of an echo component generation in the return signal ;

a subtractor (20) producing an error signal as an output signal of the echo canceller, by subtracting from the return signal the direct signal filtered by the identification filter,

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wherein the error signal  $e_t$  produced by the subtractor (20) at an instant  $t$  is expressed as  $e_t = Y_t - X_t^T H_{t-1}$ , (specification page 2, equation 1), where  $y_t$  denotes a value of the return signal at the instant  $t$ ,  $H_{t-1}$  is a column vector made up of  $L$  coefficients of the identification filter, and  $X_t^T = (x_t, x_{t-1}, \dots, x_{t-L+1})$  is a row vector made up of the values  $x_t, x_{t-1}, \dots, x_{t-L+1}$  of the direct signal at the instant  $t$  and at  $L-1$  preceding instants (see specification page 1 line 13- page 2 line 26) ;

means for obtaining prediction parameters from the direct signal, whereby the energy of a prediction residue on successive frames of the direct signal is minimized (specification page 1 line 13-page 2 line 26).

However, the prior of record fails to teach that means for adapting the coefficients of the identification filter by adding to the column vector  $H_{t-1}$  a column vector proportional to  $\frac{e_t}{X_t^T U_t + \lambda} U_t$ , where  $U_t$  is a column vector made up of the  $L$  values of the prediction residue of the direct signal at the instant  $t$  and at the  $L-1$  preceding instants, and  $\lambda$ , is a positive or zero coefficient.

These limitations, in combination with the remaining limitation of claims 17-24, are not taught nor suggested by the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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**Conclusion**

4. The prior art made of record and not relied upon is considered to applicant's disclosure. Gay (US PAT. 5,428,562), Scalart (US PAY.5,734,715), Makino (US PAT. 5,408,530), Walker (US PAT. 5,570,423) and Ding (US PAT. 6,788,785) are cite to show other the adaptive identification method and device, and adaptive echo canceller implementing such method.

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Washington, D.C. 20231

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

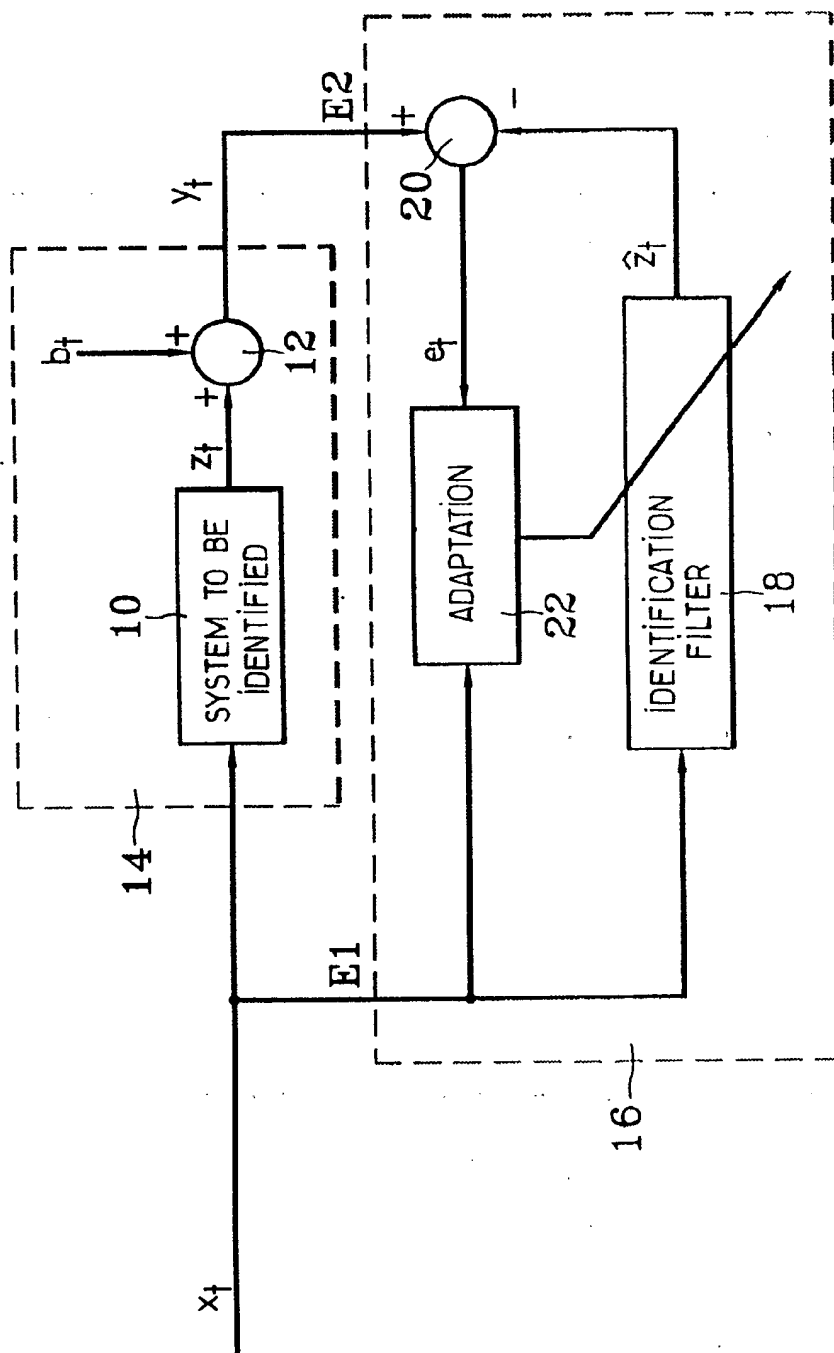
Lao,Lun-See  
Patent Examiner  
US Patent and Trademark Office  
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FIG. 1



PRIOR ART

